

REMARKS

Applicants acknowledge the allowance of claims 7-14 and respectfully request examination of pending claims 1-6 and 15-22. Applicants add claims 21 and 22 and further amend independent claims 1 and 15 for clarification. The amendments introduce no new matter, and are fully supported by the specification.

Claim Rejections Under 35 U.S.C. § 103(a)

The Examiner rejected claims 1-6 and 15-20 under 35 U.S.C. § 103(a) as being unpatentable over Korst (U.S. Patent No. 6,415,328). Further, the Examiner rejected claim 5 over Korst in view of Menon, Riegel and Wyllie. Applicants traverse the rejections over Korst.

Specifically, Korst discloses a server that reads data from multiple storage units and supplies the data as streams to users. The data is stored as blocks, such that the blocks are stored in at least two different and randomly selected storage units. Then, a scheduler reads the blocks of data from the storage units while performing load balancing on the storage units. In particular, the load balance on the multiple storage units is examined by determining the number of streams of the multiple storage units.

The multiple storage units are organized as a RAID system (col. 8, lines 10-15). However, in contrast to independent claim 1, the reference does not disclose that the RAID system is a RAID *mirroring* system. Further, the reference does not disclose mirroring in any context related to load balancing on storage units. Thus, the reference does not teach a RAID mirroring system for load balancing.

In addition, the reference discloses in columns 17-18 and column 19, lines 1-40 that three algorithms are run in simulations to determine load balances on multiple storage units. For example, one algorithm is called Linear Assignment (LA). In a table of column 17, for five storage units (disks) with the number of streams per number of disks being 10, the maximum observed load is 13 and the number of times the maximum load is observed is 31. By comparing the loads of various sets of disks (i.e. in sets of 5 disks), the table illustrates that an algorithm using a particular number of sets of disks achieves a good result.

Further, in column 20, the simulated result of a Maximum Flow Assignment (MFA) algorithm has load balancing results based on the percentage of duplication of

the blocks. For example, 25% duplication means that 1 out of four blocks is duplicated. Further, the simulations illustrate that 60-80% duplication gives good results for load balancing. Thus, while the reference discloses loads based on the number of streams of the storage units to determine the algorithm to use for good load balancing results, the reference does not disclose that the loads and number of streams are counters.

Specifically, what the reference fails to disclose are first and second counters such that the first counter is associated with the first disk drive and the second counter is associated with the second disk drive. Further, upon receiving a read command, the method of independent claim 1 determines which of the first and second counters is a lower value counter or if the first and second counter are of equal value. For example in comparison to independent claim 1, the reference discloses on column 4, lines 39-45 that storage units A and B have equal loads. These loads are defined by the reference in columns 17 and 18 as the number of streams per number of sets of disks. However, the reference does not disclose that the loads are counters assigned to each disk.

Assuming arguendo that the loads are counters, the reference discloses that a storage unit C has a load one higher than the loads on A and B. A request is assigned to A, which then increases the load on A to equal C. Then, another request will be assigned to A or C. Thus, the load on B is lower than the loads on A and C. To solve this problem of unbalanced loads, the reference teaches assigning the two requests together, where one request is assigned to A and the second request is assigned to B. Thus, A, B, and C have equal loads.

The Office proffers that selecting a drive associated with the lower value counter or if the counters are of equal value, selecting the first drive is “no more than a matter of an engineering choice.” However, as taught by the reference, the selection of the storage units is based on adding a request to storage units with equal loads while ignoring the storage unit with the lower load. Alternatively, the reference teaches waiting for multiple requests and assigning each request to equalize the load balances on all storage units. E.g. see above with reference to assigning requests to A, B, and C. Thus, one of ordinary skill in the art looking to the reference would not be taught to *select a drive associated with the lower value counter for a single request.*

Using the teachings of Korst, the selection is based on either choosing one of the storage units with equal loads or waiting for multiple requests to assign to the storage units. Thus, the reference does not teach or suggest selecting one drive per single request, such that the selection is driven by choosing disks with lower value counters.

Accordingly, Applicants submit that independent claims 1 and 15 are allowable over Korst because the reference does not teach or suggest a first and second drive such that the first drive is associated with a first counter, and a second drive is associated with a second counter, wherein the first and second drives are mirrors of one another. Moreover, because dependent claims 2-6 and 16-20 depend from allowable independent claims 1 and 15, respectively, the dependent claims are allowable for at least the same reasons.

Applicants respectfully request a Notice of Allowance based on the foregoing remarks. If the Examiner has any questions concerning the present amendment, the Examiner is kindly requested to contact the undersigned at (408) 749-6900. If any other fees are due in connection with filing this amendment, the Commissioner is also authorized to charge Deposit Account No. 50-0805 (Order No. ADAPP207). A copy of the transmittal is enclosed for this purpose.

Respectfully submitted,
MARTINE & PENILLA, LLP



Michael L. Gencarella
Reg. No. 44,703

Martine & Penilla, LLP
710 Lakeway Drive, Suite 170
Sunnyvale, California 94086
Tel: (408) 749-6900
Customer No. 25920